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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/081,975	02/22/2002	Yoshikazu Sugiyama	10834-005001	2211
26211	7590	05/10/2004	EXAMINER	
FISH & RICHARDSON P.C. 45 ROCKEFELLER PLAZA, SUITE 2800 NEW YORK, NY 10111			THOMAS, BRANDI N	
			ART UNIT	PAPER NUMBER
			2873	

DATE MAILED: 05/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/081,975

Applicant(s)

SUGIYAMA ET AL.

Examiner

Brandi N Thomas

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed on 3/18/04.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input checked="" type="checkbox"/> Other: <u>Detailed Action</u> . |

DETAILED ACTION

Response to Remarks

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.
2. Advisory Action has been withdrawn since the last amendment to the claims was submitted prior to the Final Rejection rather than after the Final Rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muraki (4974919) in view of Ueyama et al. (6467911 B1).

Regarding claim 1, Muraki et al. discloses, as in figures 1 and 2, an illumination optical system (col. 3, lines 10-15) comprising: an afocal beam expander system (12) which expands a beam illuminated from a laser light source (11); a linear beam-forming lens system (14) at least refractive power in a second direction which is substantially at a right angle to at least a first direction (col. 19, lines 21-26), the linear beam-forming lens system converting the beam, illuminated from said beam expander system, to a linear beam having its long side in the first direction (col. 19, lines 56-59); a lens array section (13) having a plurality of element

Art Unit: 2873

lenses, arranged along said first direction (col. 17, lines 53-56); and a condenser optical system (16) which illuminates a processed face by reconnecting images of said linear beam from each of said element lenses thereon (col. 17, lines 66-68 and col. 18, lines 1-4) except that it does not show wherein at least one of said linear beam-forming lens system, said lens array section, and said condenser optical system is movable along an optical axis (section 0055). Ueyama et al. shows that it is known to provide a lens array that is movable along an optical axis for varying the state of illumination and adjusting the brightness (col. 26, lines 62-64 and col. 27, lines 8-10). Therefore it would have been obvious to someone of ordinary skill in the art at the time the invention was made to combine the teaching of Muraki et al. with the movable lens array of Ueyama et al. for the purpose of varying the state of illumination and adjusting the brightness (col. 26, lines 62-64 and col. 27, lines 8-10).

Regarding claim 2, Muraki et al. discloses, as in figures 4a-4c, wherein the linear beam-forming lens system comprising a cylindrical lens (32b) having refractive power in said second direction (col. 10, lines 58-61).

Regarding claim 3, Muraki et al. discloses wherein at least one of said cylindrical lens, said lens array section, and said condenser optical system being movable along an optical axis (col. 7, lines 24-26).

Regarding claim 4, Muraki discloses a lens array except it does not show a first sub array section and a second sub array section. Ueyama et al. disclosed a first and second lens array instead of a first sub array section and a second sub array section of a lens array. It would have been obvious to one having ordinary skill in the art at the time the invention was made to

Art Unit: 2873

substitute the sub array sections with the first and second lens arrays for the purpose of the lens arrays provide the same functions in an illumination system.

Regarding claim 5, Muraki et al. discloses, as in figures 1 and 2, a condenser optical system comprising, on the side of said processed face, another cylindrical lens (16) having refractive power in said second direction (col. 7, lines 32-42).

Regarding claim 6, Muraki et al. discloses, as in figures 1 and 2, a laser light source (11) which supplies laser light; the illumination optical system (13, 14, and 16) as described in the above claims; and a scanning-moving section (15) which moves the linear beam on said processed face and said processed face in relation to each other (col. 6, lines 33-45).

Regarding claim 7, Muraki et al. discloses, as in figures 4a-4c, an illumination optical system (col. 3, lines 10-15) comprising: a prism member (31a and 31b) which splits a beam, illuminated from a laser light source (11), into a plurality of light beams in a first direction and reconnects the plurality of light beams on a predetermined face (col. 9, lines 22-33); a linear beam-forming lens system (14) having at least refractive power in a second direction which is substantially at a right angle to at least said first direction (col. 19, lines 21-26), the linear beam-forming lens system converting said plurality of split beams to a linear beam having its long side in the first direction (col. 19, lines 56-59); an expanding system (12) which expands said linear beam in said first direction, and illuminates it onto a processed face (col. 2, lines 60-64) (figures 1 and 2).

Regarding claim 8, Muraki et al. discloses, as in figure 5b, wherein the prism member (53) comprises a trapezoid prism, and the position of said predetermined face, where said plurality of light beams which were split by said trapezoid prism are connected, substantially

Art Unit: 2873

matches the focal positions of said linear beam-forming lens system in said second direction (col. 14, lines 44-55).

Regarding claim 9, Muraki et al. discloses, as in figure 7b, wherein the expanding optical system comprising an optical system (71 and 72) which is rotationally symmetric to an optical axis (col. 16, lines 17-26).

Regarding claim 10, Muraki et al. discloses, as in figures 4a-4c, wherein the linear beam-forming lens system comprising a cylindrical lens (32b) having refractive power in said second direction (col. 10, lines 58-61).

Regarding claim 11, Muraki et al. discloses, as in figures 1 and 2, said expanding optical system comprising, on the side of said processed face, a second cylindrical lens (16) having refractive power in said second direction (col. 7, lines 32-42).

Regarding claim 12, Muraki et al. discloses wherein at least one of said first cylindrical lens and said second cylindrical lens being movable along an optical axis (col. 7, lines 24-26).

Regarding claim 13, it is inherent that the function of the beam expander is to expand the diameter of the beam. Muraki et al. discloses, as in figures 1 and 2, the beam is expanded more greatly in the first direction than in the second direction.

Regarding claim 14, Muraki et al. discloses, as in figures 1, 2, and 4a-4c, an illumination optical system (13, 14, and 16) as described in the above claims; and a scanning-moving section (15) which moves the linear beam on said processed face and said processed face in relation to each other (col. 6, lines 33-45).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tanaka (6393042 B1) discloses a beam homogenizer, which can unify the energy distribution of a linear laser beam in a longitudinal direction.

Ohta (6183094 B1) discloses a projecting apparatus and an illuminating apparatus that can concentrate the light from the light source on the illumination object to the extent possible.

Response to Arguments

6. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 571-272-2341. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


Art Unit: 2873

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BNT

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April 29, 2004


RICKY MACK
PRIMARY EXAMINER